

Comparing Borehole Single Point Fibre Recording to Standard Linear Fibre Recording

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Summary

This presentation will show a direct comparison between standard fibre recording along a single mode fibre that is cemented in place for Carbon Injection Monitoring and a standard wireline deployment of a fibre point sensor recording.

Objective

Full VSP processing was performed on both a standard linear single mode fibre recorded at the CaMI Carbon Injection test site as well as data simultaneously recorded using Geospace Technologies Insight point receiver system. The Geospace Insight downhole receiver array uses fibre technology (B. Bunn et al., 2024) rather than Geophones to record the full three component wavefield that is typical in a standard VSP data set. The deployment of this fibre system is identical to a standard wireline deployment and offers some magnetic clamping of the receiver to the casing in a wellbore. Having both data sets recorded with simultaneous recording keeps the comparison Apples-to-Apples in a real world situation.

The three component data recorded in a VSP can offer an advantage over the normal DAS recording given some directionality to the data as well as the ability to more effectively analyse the full waveform in the data.



Figure 1 the picture on the left shows the deployment of the downhole array and the picture on the right shows a close up of the tools with the FO wireline cable separating each receiver station by 15 meters.

Acknowledgements

The authors would like to acknowledge all project collaborators including contributions from Mike Dahl of Geospace Technologies, and Marie Macquet of CaMI CMC.

References

Brett Bunn and Paul E. Murray, Using advanced fibre-optic point sensors at high temperatures to expand downhole deployment use cases. First Break Volume 42, 2024, p91-94